

REMARKS

Claims 1-26 were pending in the application and stand rejected. Claim 27 is new. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 103

Claims 1-18 and 25-26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over DeMeester et al. (U.S. Pat. No. 6,029,081) in view of Cuppen (U.S. Pat. No. 5,689,190) and Carrozzi et al. (U.S. Pat. No. 6,346,814). This rejection is respectfully traversed. In contrast to the present application, none of the foregoing references teach or suggest a magnetic navigation system.

DeMeester et al., Cuppen and Carrozzi et al. describe magnetic resonance imaging (MRI) or nuclear magnetic resonance (NMR) imaging apparatus. Generally, NMR and MRI techniques employ a spatially uniform and temporally constant main magnetic field B_0 , generated through an examination region in which a patient or subject being examined is placed (DeMeester et al., col. 1, lines 12-16). DeMeester et al. teaches an imaging apparatus having a main magnet for generating a substantially uniform and temporally constant main magnetic field through the examination region. The main magnet includes a stationary pole piece (24) and a movable pole piece (22) (abstract). If all or part of the main magnet of DeMeester et al. were to be moved while the main magnet is in use during imaging, the magnetic field of the main magnet would no longer be substantially uniform or temporally constant. An invasive medical procedure is performed after the main magnet, or a portion thereof, is moved to a

remote location (col. 3, lines 28-33; claim 12). It also is apparent that the gradient coil assembly 36 and RF transmitter 40 of DeMeester et al. are stationary while in use to generate an image.

It is admitted in the Office Action that neither DeMeester et al. nor Cuppen disclose both magnets as being individually positionable. It is further asserted in the Office Action that Carrozzi et al. discloses individually positionable magnets. Carrozzi et al. discloses a receiving coil 30 having a rotatable fastening base (FIGS. 4 and 5). It is apparent, however, that the receiving coil of Carrozzi et al. is locked in place and stationary while an image is being generated (col. 7, lines 32-47).

With reference to claim 1, the claim is amended to recite "...a control for operating the positioners of each magnet unit to selectively change the positions of the magnets *to maintain the magnetic field direction applied to the operating region by the magnets while the locations of the magnet units relative to the operating region change*". DeMeester et al., alone or in combination with Cuppen and/or Carrozzi et al., does not teach or suggest moving a magnet while it is being used to generate an image. Furthermore, DeMeester et al. teaches a main magnet for generating a substantially uniform and temporally constant main magnetic field. The foregoing references do not teach or suggest the recitations of amended claim 1. Accordingly, Applicants submit that claim 1, and claim 2 dependent on claim 1, should be allowed.

With reference to independent claim 3, the claim is amended to recite "...a control for operating the positioners of each magnet unit to selectively change the positions of the magnets to apply a magnetic field in a selected direction to the operating region *to orient the magnetically responsive device*." As discussed above,

DeMeester et al., Cuppen and Carrozzi et al. describe imaging apparatus and do not teach or suggest a magnetic navigation system for orienting a magnetically responsive device in an operating region in a subject. Accordingly, Applicants submit that claim 3, and claim 4 dependent on claim 3, should be allowed.

With reference to independent claim 5, the claim is amended to recite "...a control for operating the positioners of each magnet unit to selectively change the positions of the magnets to apply a magnetic field to a *magnetically responsive device* in the operating region..." As discussed above, DeMeester et al., alone or in combination with Cuppen and/or Carrozzi et al., do not teach or suggest orienting a magnetically responsive device in an operating region in a subject. Accordingly, Applicants submit that claim 5 as amended should be allowed.

Independent claim 6 is amended to recite "...a positioner for changing the position of the magnet in the unit to *change the net direction of the field while the field is applied* by the at least two units to the operating region." Neither DeMeester, Cuppen nor Carrozzi et al. describe or suggest magnets which are moved while an image is being generated. Furthermore, it is admitted in the Office Action that neither DeMeester et al. nor Cuppen disclose both magnets as being individually positionable. The foregoing references do not teach or suggest the recitations of amended claim 6. Accordingly, Applicants submit that claim 6, and claims 7-11 dependent on claim 6, should be allowed.

Additionally, referring to claim 9, neither DeMeester, Cuppen nor Carrozzi et al., alone or in combination, describe a navigation system. Thus the foregoing references do not teach or suggest "...a controller for controlling the positioners ... to apply a

magnetic field in the operating region to cause the magnetically responsive device to orient substantially in the selected direction" as recited in claim 9. Applicants submit that claim 9 should be allowed.

Independent claim 12 is amended to recite "...two magnet units, each magnet unit comprising a magnet, a positioner that permits the controlled rotation of the magnet about a first axis, and the controlled pivoting of the magnet about a second axis, to change a magnetic field of the magnets to control the medical device...". As previously discussed, neither DeMeester, Cuppen nor Carrozzi et al., alone or in combination, describe a navigation system. The foregoing references do not teach or suggest the recitations of amended claim 12. Applicants submit that claim 12, and claims 13-16 dependent on claim 12, should be allowed.

Additionally, referring to claim 14, neither DeMeester, Cuppen nor Carrozzi et al., alone or in combination, describe or suggest "...first and second stanchions disposed on opposite sides of the patient support, each stanchion having an arcuate track, and mounting one of the units for coordinated movement about an arcuate path, so that the units remain opposite one another" as recited in claim 14. Applicants submit that claim 14 should be allowed.

Independent claim 17 is amended to recite "...a pair of opposed magnets mounted, each mounted for rotation about a first axis, pivoting about a second axis, and together mounted for rotation about the patient support to provide a magnetic field selectively changeable to control the device." As previously discussed, neither DeMeester, Cuppen nor Carrozzi et al., alone or in combination, describe a navigation

system. The foregoing references do not teach or suggest the recitations of amended claim 17. Accordingly, claim 17 should be allowed.

Referring to independent claim 18 and as discussed previously, Carrozzi et al. teach an imaging system having a magnet 1 and an angularly displaceable receiver coil 30 (col. 8, lines 41-47). The magnet 1 is stationary relative to a magnet case 501 (Fig. 1) or cart 40 (Figs. 11-19). The coil 30 has a fastening base that is locked into position, e.g., in a recess 401 of the magnet case 501, during imaging (col. 8, lines 41-47). An outer part 202 of a table 2 may be rotated around an inner part 102 of the table 2 affixed to the magnet case 501. In Figs. 14-15 cited in the Office Action, the magnets 1 and 30 are not rotated but are stationary relative to the table 2A. It is clear that while an image is being generated, the receiver coil 30 and magnet 1 of Carrozzi et al. are not in motion. As previously discussed, neither DeMeester, Cuppen nor Carrozzi et al., alone or in combination, describe a navigation system. Further, it would not have been obvious or even possible to combine the foregoing references, which all describe imaging system magnets that do not move while an image is being generated, to adjust the magnetic field as needed in a magnetic navigation system. The foregoing references do not teach or suggest the recitations of amended claim 18. Specifically and for example, the foregoing references do not teach or suggest "...a support for mounting the magnets on opposite sides of the operating region... and allowing the units to move in a generally arcuate path about the operating region" as recited in claim 18. Accordingly, claim 18 should be allowed.

Claim 25 is amended to recite "...two magnet units, each unit comprising a magnet and a positioner for selectively changing the orientation of the magnet to

navigate the device..." As previously discussed, neither DeMeester, Cuppen nor Carrozzi et al., alone or in combination, describe a navigation system. The foregoing references do not teach or suggest the recitations of amended claim 25. Accordingly, claim 25, and claim 26 dependent thereon, should be allowed.

Additionally, claim 26 recites "...an imaging system ...comprising a controller for coordinating the movement of the movable support and the magnet units to prevent interference." Neither DeMeester, Cuppen nor Carrozzi et al., alone or in combination, describe two imaging systems, one of which might interfere with the other.

Claims 19-22 and 24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over DeMeester et al. (U.S. Pat. No. 6,029,081) in view of Cuppen (U.S. Pat. No. 5,689,190), Carrozzi et al. (U.S. Pat. No. 6,346,814) and Damadian (U.S. Patent No. 6,346,816). This rejection is respectfully traversed.

Claim 19 is amended to recite "...selectively rotating and pivoting each magnet to maintain the magnetic field direction projected by the moving magnets as the units move on the support about an operating region of the subject to selectively orient a magnetically responsive medical device." In contrast to the present application and as previously discussed, none of the foregoing references teach or suggest a magnetic navigation system. Furthermore, neither DeMeester et al., Cuppen, Carrozzi et al., nor Damadian, any one alone or in combination with any of the others, teach or suggest the recitations of amended claim 19. Applicants submit that claim 19, and claims 20-24 dependent on claim 19, should be allowed.

Additionally, claim 20 recites "...coordinating the movement of the magnet units with an imaging system to avoid positional interference between the imaging system

and the magnet units.” Further, amended claim 21 recites “...adjusting the positions of the magnets in the magnet units while moving the magnet units to accommodate movements of an imaging system to maintain the desired orientation of the medical device.” Neither DeMeester, Cuppen nor Carrozzi et al., alone or in combination, describe two imaging systems, one of which might interfere with the other.

Claim 23 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over DeMeester et al. (U.S. Pat. No. 6,029,081) in view of Cuppen (U.S. Pat. No. 5,689,190), Carrozzi et al. (U.S. Pat. No. 6,346,814), Damadian (U.S. Patent No. 6,346,816) and Hillenbrand et al. (U.S. Pat. No. 4,949,043). This rejection is respectfully traversed. Like the previously discussed references, Hillenbrand et al. teaches an imaging system, not a navigation system. Applicants submit that claim 23 (dependent on claims 19 and 22) should be allowed.

NEW CLAIM

Claim 27 is new and is supported in the specification. The claim is directed to the system of claim 17 wherein each of the opposed magnets is mounted for translation along one of the axes. Applicants submit that claim 27 is in condition for allowance.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office

Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (314) 726-7521.

Respectfully submitted,

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